REMARKS

Applicants have amended their claims by adding new claims 8-11 to the application. Claims 8 and 9, each dependent on claim 1, respectively recites that the buffer member is made of a material selected from the group consisting of polyimide, polytetrafluoroethylene and silicone rubber; and recites that the buffer member is made of a material selected from the group consisting of polyethylene terephthalate, polyethylene and acrylonitrile butadiene rubber. Note, for example, page 12 of Applicants' specification. Claims 10 and 11, each dependent on claim 1, respectively recites that the apparatus further includes a head having a press surface, with the buffer member being interposed between the mold and the head; and recites that the buffer member is positioned between the substrate and a stage for carrying the substrate. Note, for example, page 15 of Applicants' specification.

The restriction requirement set forth in Items 1 and 2 on page 2 of the Office Action mailed May 16, 2006, is noted. Applicants respectfully affirm their election of the Group I claims (that is, claims 1 and 2, which the Examiner states is drawn to a nanoprint apparatus). It is respectfully submitted that newly added claims 8-12, in addition to claims 1 and 2, read on the elected invention.

Applicants respectfully submit that all of the claims being presented for consideration by the Examiner on the merits patentably distinguishes over the teachings of the prior art applied by the Examiner in rejecting claims in the Office Action mailed May 16, 2006, that is, the teachings of the U.S. Patents to Chou, No. 5,772,905, and to Rowland, No. 4,244,683, under the provisions of 35 USC 103.

It is respectfully submitted that these references as applied by the Examiner would have neither taught nor would have suggested such a nanoprint apparatus as in the present claims, including, inter alia, wherein the substrate and a mold formed

on its surface with fine concavities and convexities are heated and pressed to each other through the intermediary of a buffer member, and with this apparatus further including a mechanism for successively replacing the buffer member with a new buffer member after the heating and pressing. See claim 1.

As will be seen in the following, it is respectfully submitted that the applied prior art would have neither disclosed nor would have suggested an apparatus having a buffer member, much less the mechanism for successively replacing the buffer member after the heating and pressing, whereby a new buffer member can be utilized for succeeding formations of a fine structure of a substrate.

Furthermore, it is respectfully submitted that the teachings of the applied references would have neither disclosed nor would have suggested such a nanoprint apparatus as in the present claims, having features as discussed previously in connection with claim 1, and additionally including the features set forth in each of the dependent claims being considered on the merits, such as (but not limited to) wherein the buffer member is larger than a pattern forming area of the mold, but smaller than an external shape of the substrate (upon which the fine structure is formed form the mold) and the external shape of the mold (see claim 2); and/or material of the buffer member as in claims 8 and 9; and/or positioning of the buffer member as in claims 10 and 11.

The present invention is directed to a nanoprint apparatus, for making a fine structure on a substrate with the use of a mold having a heating and pressing mechanism.

As described in the paragraph bridging pages 2 and 3 of Applicants' specification, there has been proposed a technology for fabricating a fine pattern using a mold having concavities and convexities defining a predetermined pattern for

forming a fine pattern on a substrate. However, previously proposed techniques do not have sufficient accuracy in transferring a pattern, for fabricating a fine pattern; and, accordingly, it is desired to provide an apparatus capable of transferring a pattern with a higher degree of accuracy, useful, for example, in manufacturing semiconductor devices.

Against this background, Applicants provide a nanoprint apparatus having desired accuracy. Applicants have found that by utilizing a buffer material as in the present claims, with the buffer material being successively replaced using a mechanism as recited in the present claims, such greater accuracy of the fine pattern is obtained. In particular, through use of the buffer member as in the present claims, especially by automatically replacing the buffer member, e.g., having been deformed by heating and pressing, with a new buffer member, stress concentration in an end part of the sample can be prevented so as to uniformly apply a pressure only over the concave and convex area of the mold, with unevenness among the formed structures being decreased. Such accuracy of transcription can be enhanced through use of a buffer member configured as in the present claims, smaller than the external shape of the substrate and the external shape of the mold, but larger than a pattern forming area of the mold. Note, for example, the paragraph bridging pages 14 and 15 of Applicants' specification. See also the paragraph bridging pages 30 and 31 of Applicants' specification.

Chou discloses a process that creates patterns with ultra fine features in a thin film carried on a surface of a substrate. According to this process, a layer of thin film is deposited upon a surface of the substrate. A mold having at least one protruding feature and a recess is pressed into the thin film, therefore the thickness of the film under the protruding feature is thinner than the thickness of the film under

the recess and a relief is formed in the thin film. The relief generally conforms to the shape of the feature on the mold; and after the mold is removed from the film, the thin film is processed such that the thinner portion of the film in the relief is removed exposing the underlying substrate, thereby replicating patterns in the mold in the thin film, completing the lithography. See column 1, lines 4-8, and column 2, lines 21-32. See also column 5, lines 43-57.

Fig. 9 and the corresponding description at column 6, lines 31-41, of Chou, describe apparatus for carrying out the process in Chou. Thus, the apparatus 50 includes stationary block 52 carrying substrate 18 and movable molding block 54 carrying mold 10. Blocks 52 and 54 carry the substrate and mold 10; and a controller 56 is coupled to x-y positioner 58 and z positioner 60. An alignment mark 64 is on mold 10 and complementary mark 68 is on substrate 18, and sensor 62 carried in block 54 couples to alignment marks 64 and 68 and provides an alignment signal to controller 56.

It is respectfully submitted that Chou would have neither taught nor would have suggested such apparatus as in the present claims, including, inter alia, the buffer member, much less the mechanism for successively replacing the buffer member with a new one after heating and pressing, and advantages achieved thereby as discussed in the foregoing.

On page 3 of the Office Action mailed May 16, 2006, the Examiner contends that in Fig. 1 of Chou, the "layer above is equivalent to the buffer member". However, the Examiner does not indicate the layer above what is "equivalent to the buffer member". If the Examiner contends that the structure represented by reference character 12 in Fig. 1A "is equivalent to the buffer member", Applicants respectfully traverse this characterization by the Examiner. If the "layer above"

referred to by the Examiner is the structure represented by reference character 12, reference character 12 in Chou represents a body, of the mold; and it is respectfully submitted that this body of the mold does not disclose, nor would have suggested, such buffer member as in the present claims, or advantages thereof.

Moreover, it is noted that the Examiner has not even alleged that Chou discloses a buffer member, merely contending that the "layer above is equivalent to the buffer member" (emphasis added). Thus, the Examiner has not alleged that Chou discloses a buffer member.

The Examiner acknowledges that Chou "fails to teach a mechanism for successively replacing the buffer member", but contends that Rowland teaches continuously supplying a member via a mechanism. However, as will be shown in the following, it is respectfully submitted that Rowland would have neither taught nor would have suggested, either alone or in combination with the teachings of Chou, a mechanism for successively replacing the buffer member with a new one as in the present claims, and advantages thereof.

Thus, Rowland discloses apparatus for continuously embossing synthetic thermoplastic sheeting which includes a frame and an elongated member mounted for movement in a path along the frame. A series of at least three presses is mounted on the frame along the path, with each press having a first platen in spaced relationship to the upper surface of the elongated member and a second platen disposed in spaced relationship to the other surface of the elongated member. Press operating means is provided for operating all of the presses to open and close the platens. Note column 2, lines 48-67. A multiplicity of mold members overlies the elongated member, and the mold members are adapted to emboss synthetic plastic sheeting material disposed therebetween, the molds having an embossing surface

defining a multiplicity of closely spaced cavities of microprism cross section. See column 3, lines 3-8. Note also column 3, line 45 to column 4, line 10. See also Fig. 1 and the corresponding description at column 5, lines 13-23. Note also column 7, line 63 through column 8, line 2; and column 8, lines 59-62. See also column 10, lines 1-8, further defining the molds used in the apparatus of Rowland.

It is respectfully submitted that Rowland discloses a multiplicity of molds. It is respectfully submitted that the teachings of Rowland, even in combination with the teachings of Chou, would have neither disclosed nor would have suggested the presently claimed subject matter, including, inter alia, the buffer member, or the mechanism for successively replacing the buffer member, as in the present claims, and advantages thereof. Furthermore, it is respectfully submitted that the combined teachings of these references would have neither disclosed nor would have suggested the presently claimed subject matter, including additional features in the dependent claims, such as relative size of the buffer member to the pattern forming area of the mold, external shape of the substrate and external shape of the mold, as in claim 2, materials of the buffer member, or positioning of the buffer member, as in the present claims being considered on the merits.

In view of the foregoing comments and amendments, reconsideration and allowance of all claims presently in the application are respectfully requested.

To the extent necessary, Applicants petition for an extension of time under 37 CFR 1.136. Please charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, to the Deposit Account of Antonelli, Terry, Stout & Kraus, LLP, Account No. 01-2135 (Docket No. 500.43682X00) and please credit any excess fees to such Deposit Account.

Respectfully submitted,

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